Quasiclassical Description of Spin-Peierls Phenomena: Generalized Coherent States and Nonlinear Spin Waves

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We investigate quasiclassical behaviour of the S=1/2 Heisenberg antiferromagnet with frustration and dimerization by use of both generalized coherent states of SU(2) group and Heisenberg-Weyl (Glauber) coherent state. In the region of frustration parameter $\alpha < \alpha_c$ the so-called nonlinear sigma-model with renormalized characteristic velocity and frequency is derived by use of SU(2) coherent states technique. In this approximation the exact critical value of frustration parameter $\alpha = 1/4$ is obtained. In the region of frustration parameter $\alpha > \alpha_c$ by use of bond -operator representation the system of tree nonlinear Schroedinger equations in terms of Glauber coherent states is received which give us quasiclassical description of nonlinear waves in frustrated antiferromagnet with dimerization. Linearized dispersion of this system of equations coincides with the linearized spectrum of elementary exitations of the model received by use of Bogoliubov transformation. Soliton dynamics of "kink-antikink" pairs of the received system of equations is discussed.